

Injuries and Restraint Use of Motor Vehicle Occupants in California, 2015-2021

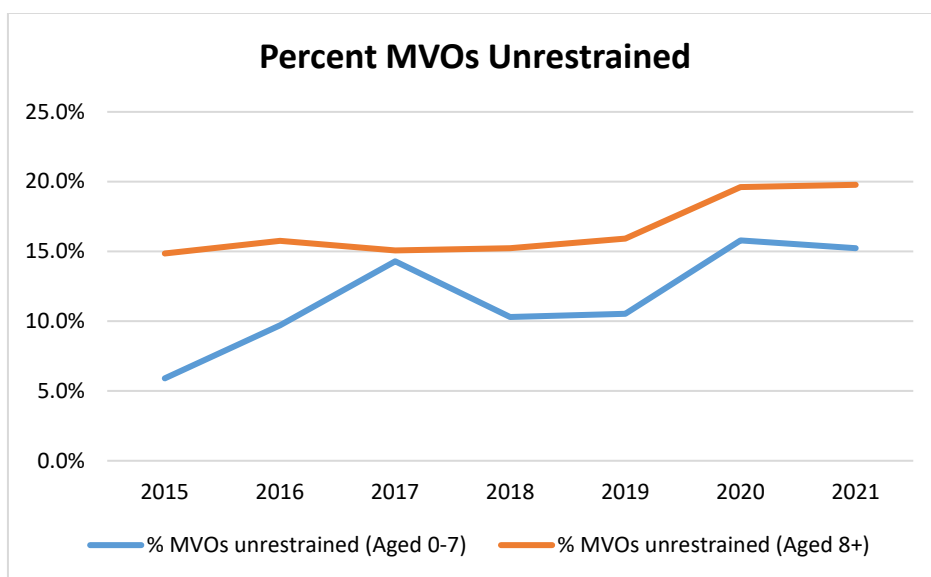
Introduction

California strives for a transportation system with no fatal or serious injuries for all road users.¹ Wearing seat belts and properly buckling children into age- and size-appropriate car seats and booster seats are one of the most effective ways to prevent death or serious injury in the event of a crash.¹ In 2018, 93% of Californian adults reported always wearing a seat belt.¹ However, hundreds of unrestrained motor vehicle occupants (MVOs) die or are seriously injured on California roadways each year. This data brief describes trends in restraint use among motor vehicle occupants, excluding motorcyclists, involved in a fatal crash in California. It also compares injury severity among restrained and unrestrained MVOs involved in a fatal crash. Data are presented separately for MVOs under and over the age of 8 because California law requires that children must be secured in a car seat or booster seat in the back seat of the vehicle until they reach age 8 (or have reached 4 feet 9 inches in height), whereas those age 8 and older are able to use seat belts.²

Results

From 2015 to 2021, 50,735 MVOs, including both drivers and passengers, were involved in fatal crashes in California. Of these, 4,614 (9.1%) were of an unknown age or their restraint status was unknown. Of the remaining 46,121 MVOs of known age and known restraint use, 1,867 (4.0%) were aged 0-7 and 44,254 (96.0%) were aged 8+. Over the entire seven-year period, 216 (11.6%) of MVOs aged 0-7 were unrestrained, whereas 7,370 (16.7%) of MVOs aged 8 or older were unrestrained. Figure 1 presents the proportion of unrestrained MVOs for each year by two MVO age groups (0-7 and 8+).

Figure 1. Percent of motor vehicle occupants (MVOs) involved in a fatal motor vehicle crash who were unrestrained by age group and year, 2015 to 2021 (percentages based on known restraint use).



Of the 1,867 MVOs aged 0-7 involved in fatal crashes in California from 2015 to 2021 where restraint use was known, 15 (0.8%) of these MVOs were excluded from the analysis because the severity of their injuries was unknown; thus, there were a total of 1,852 MVOs aged 0-7 included in this analysis. Table 1 presents injury severity by restrained and unrestrained MVOs aged 0-7 involved in fatal crashes. Serious or fatal injuries occurred among 57.9% (125 out of 216) of the unrestrained MVOs under age 8 but only 19.6% (320 out of 1,636) of the restrained MVOs under age 8.

Of the 44,254 MVOs aged 8 or older involved in fatal crashes in California from 2015 to 2021 where restraint use was known, 834 (1.9%) of these MVOs were excluded from the analysis because the severity of their injuries was unknown; thus, there were a total of 43,420 MVOs aged 8 or older included in this analysis. Table 2 presents injury severity by restrained and unrestrained MVOs aged 8 or older involved in fatal crashes. Serious or fatal injuries occurred among 81.7% (6,001 out of 7,349) of the unrestrained MVOs aged 8 or older but only 34.0% (12,256 out of 36,071) of the restrained MVOs aged 8 or older.

Table 1. Injury Severity by Restraint Use among Motor Vehicle Occupants (MVOs) aged 0-7 involved in a fatal motor vehicle crash in California, 2015-2021.

Injury Severity	Frequency of Restrained MVOs	%	Frequency of Unrestrained MVOs	%
No Apparent Injury	879	53.7%	37	17.1%
Possible Injury	148	9.0%	15	6.9%
Suspected Minor Injury	289	17.7%	39	18.1%
Suspected Serious Injury	150	9.2%	67	31.0%
Fatal Injury	170	10.4%	58	26.9%

Table 2. Injury Severity by Restraint Use among Motor Vehicle Occupants (MVOs) aged 8+ involved in a fatal motor vehicle crash in California, 2015-2021.

Injury Severity	Frequency of Restrained MVOs	%	Frequency of Unrestrained MVOs	%
No Apparent Injury	15,189	42.1%	388	5.3%
Possible Injury	4,124	11.4%	377	5.1%
Suspected Minor Injury	4,502	12.5%	583	7.9%
Suspected Serious Injury	3,807	10.6%	1,060	14.4%
Fatal Injury	8,449	23.4%	4,941	67.2%

Discussion

Of the MVOs involved in a fatal crash in California, those who are aged 8 or older have a consistently greater proportion of no restraint use. The proportion of unrestrained MVOs increased sharply from 2015 to 2017 and again from 2019 to 2020 for the 0-7 age group. For both MVO age groups, the proportion of unrestrained MVOs increased sharply from 2019 to 2020. This is in line with an increase in riskier riding behaviors observed during the pandemic, including failure to wear seat belts.³ Additional messaging and education for MVOs of all ages may now be required to reinforce norms of safe riding.

The proportion of MVOs aged 8 or older involved in a fatal crash who suffered a serious or fatal injury in the crash was 2.4 times higher among those unrestrained compared to those restrained (81.7% versus 34.0%). Among children under age 8, the proportion who suffered a serious or fatal injury was almost 3 times higher among those unrestrained (57.9% versus 19.6%). Restraints appear to be effective at helping prevent serious or fatal injuries among MVOs involved in crashes severe enough to cause at least one death for both children and those older than age 8.

Conclusion

Unfortunately, fatalities and serious injuries where motor vehicle occupants are unrestrained still occur. From 2015 to 2021, there were 6,126 in California, 125 of whom were children under age 8. The goal of this data brief is to remind the reader of the importance of restraint use to help prevent fatalities and serious injuries among passengers. The National Highway Traffic Safety Administration (NHTSA) has identified passengers must use [seat belts and child restraints](#) to reduce MVC fatalities and injuries.⁴ Parents or those regularly driving with young children are encouraged to take the following actions: (1) select a car seat based on their child's size, (2) choose a seat that fits their vehicle, and (3) use the car seat every time.⁵

Technical Notes

Fatality Analysis Reporting System (FARS) data were used to produce this data brief. This data brief utilized data from the 2015-2020 Final FARS Files and the 2021 Annual Release File (ARF). Please note that the 2021 ARF contains preliminary data that are not finalized and may be a slight undercount.

NHTSA states that to qualify as a FARS case, the crash had to involve a motor vehicle traveling on a trafficway customarily open to the public, and it must have resulted in the death of a motorist or a non-motorist within 30 days of the crash.⁶

For the purposes of this data brief, the terms "suspected serious injury" and "serious injury" are interchangeable. A motor vehicle occupant is either a passenger or a driver; motorcyclists are excluded and are not counted as motor vehicle occupants.

Any of the following meets the criteria of a restraint: (1) shoulder belt; (2) lap belt; (3) lap and shoulder belt; (4) racing-style harness; (5) forward facing child safety seat; (6) rear facing child safety seat; and (7) booster seat. Please note that the data do not differentiate between proper and improper restraint use.

The fatality and serious injury rates for restrained and unrestrained motor vehicle occupants presented here are not intended to be used to calculate effectiveness estimates for restraint use. Certain factors involved in the crash were not accounted for (such as occupant seating position, number of vehicles involved, proper restraint use, etc.) and thus this data brief cannot be used to estimate the effectiveness of restraint use.

Endnotes

- ¹ Centers for Disease Control and Prevention. (2020, July). *Buckle up: Restraint use California*. https://www.cdc.gov/transportationsafety/pdf/seatbelts/2020/CDC-Restraint-Use-Fact-Sheets_California.pdf
- ² California Highway Patrol. (n.d.). *Child Safety Seats*. <https://www.chp.ca.gov/programs-services/programs/child-safety-seats>
- ³ U.S. Government Accountability Office. (2022, January 22). *During covid-19, road fatalities increased and transit ridership dipped*. <https://www.gao.gov/blog/during-covid-19-road-fatalities-increased-and-transit-ridership-dipped>
- ⁴ National Highway Traffic Safety Administration. (n.d.) *Seat belts and child restraints*. <https://www.nhtsa.gov/book/countermeasures/countermeasures-work/seat-belts-and-child-restraints>
- ⁵ California Department of Public Health. (2022, September). *California laws – Keep your child safe in the car*. [https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/SACB/CDPH Document Library/Child Passenger Safety Program \(VOSP\)/ChildSafetyBrochure_EngVer2023.pdf](https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/SACB/CDPH%20Document%20Library/Child%20Passenger%20Safety%20Program%20(VOSP)/ChildSafetyBrochure_EngVer2023.pdf)
- ⁶ National Highway Traffic Safety Administration. (2023, April). *Fatality Analysis Reporting System Analytical User's Manual, 1975-2021*. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813417>

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Source Files: National Highway Traffic Safety Administration
Fatality Analysis Reporting System (FARS)
2015-2020 Final Files and the 2021 Annual Release
File. Data retrieved September 2023
from <https://www.nhtsa.gov/node/97996/251>.

